

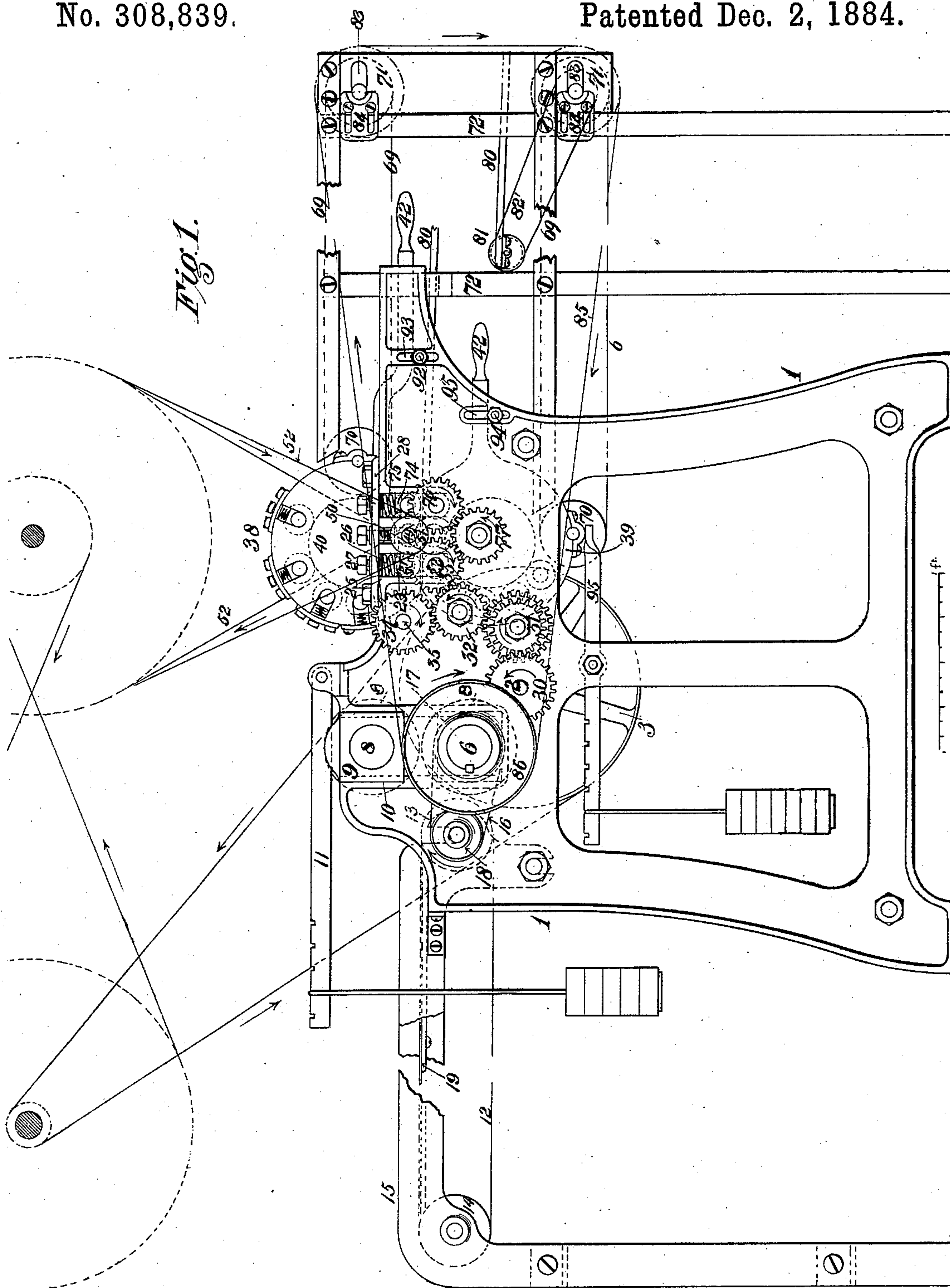
(No Model.)

5 Sheets—Sheet 1.

G. GIBSON.
DECORTICATING MACHINE.

No. 308,839.

Patented Dec. 2, 1884.



WITNESSES:

A. M. Clarke
Danin S. Wolcott

INVENTOR,

George Gibson
BY *George H. Christy*
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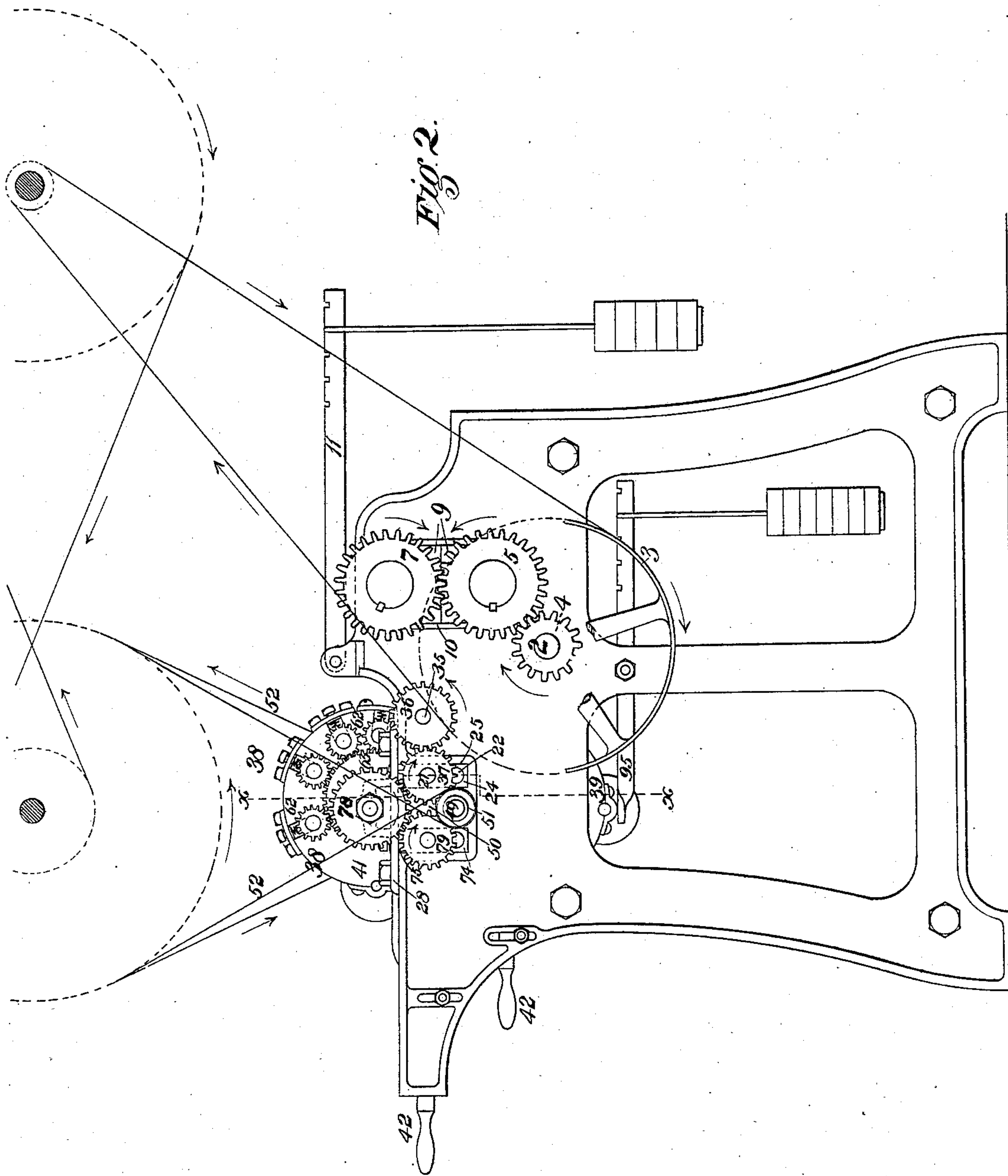
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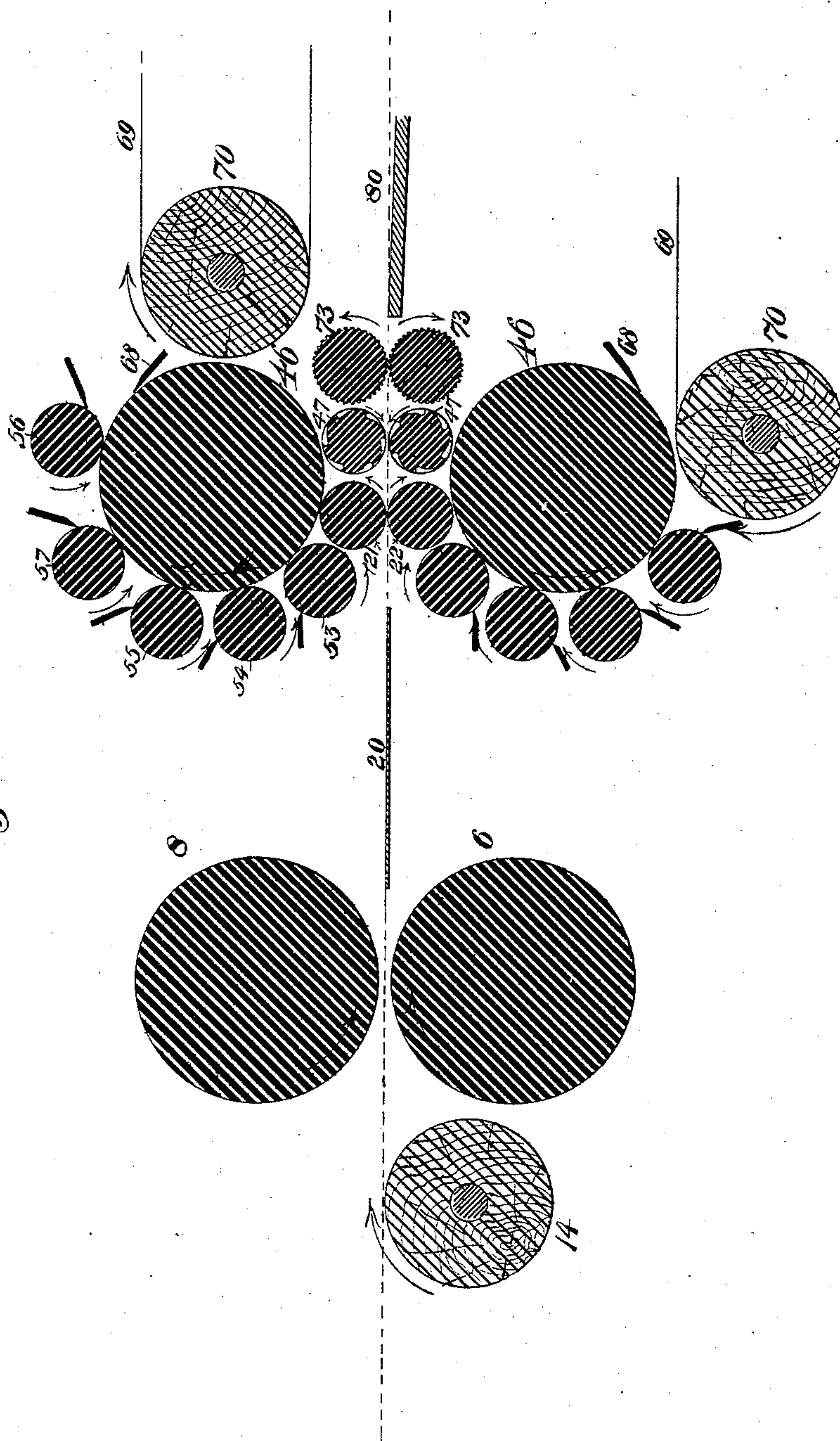
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Fig. 3.



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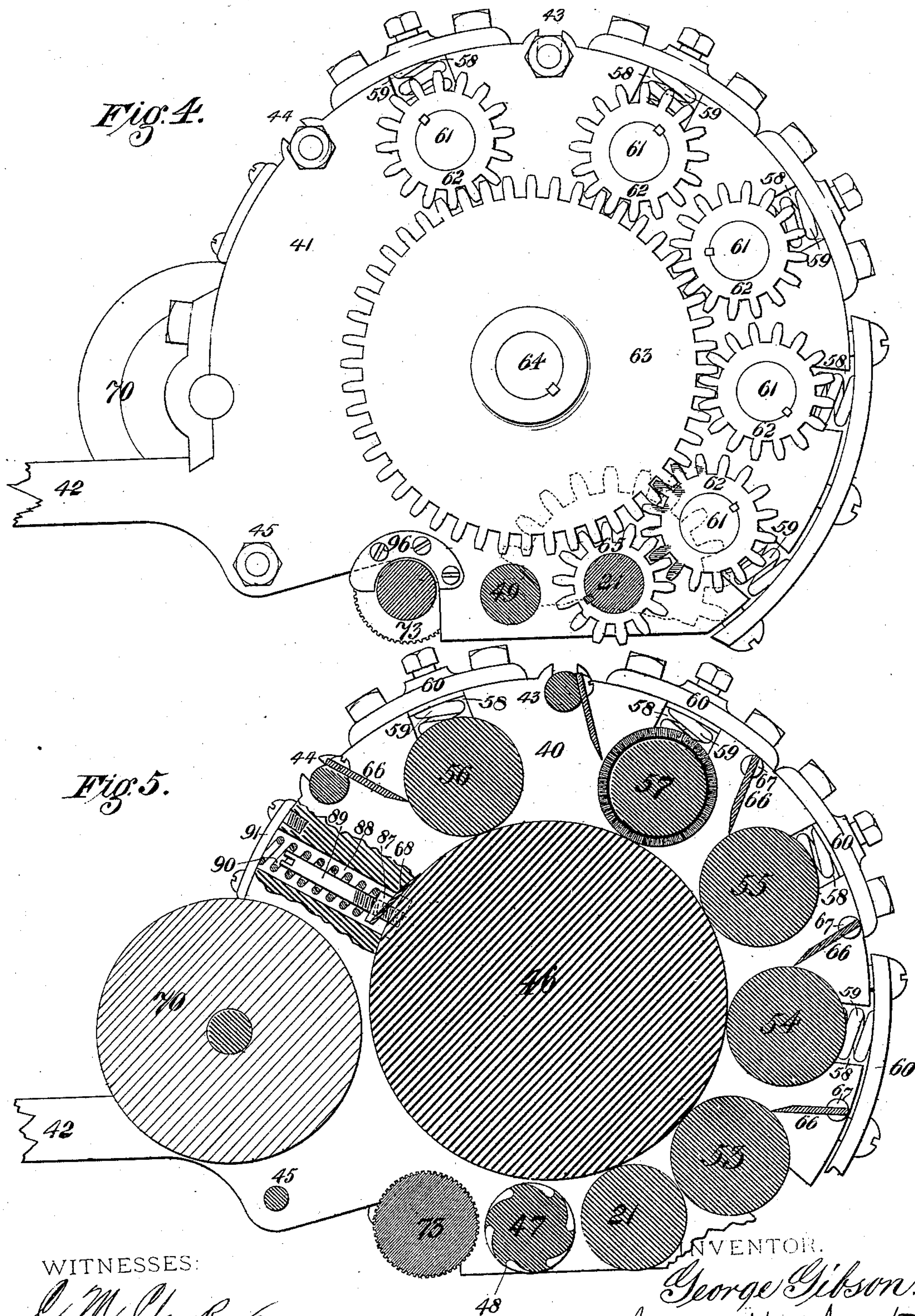
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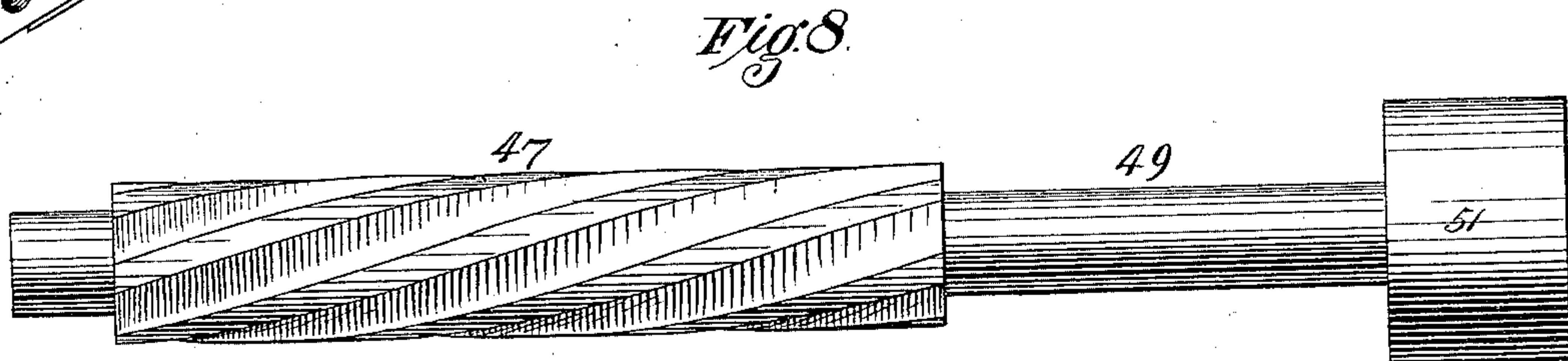
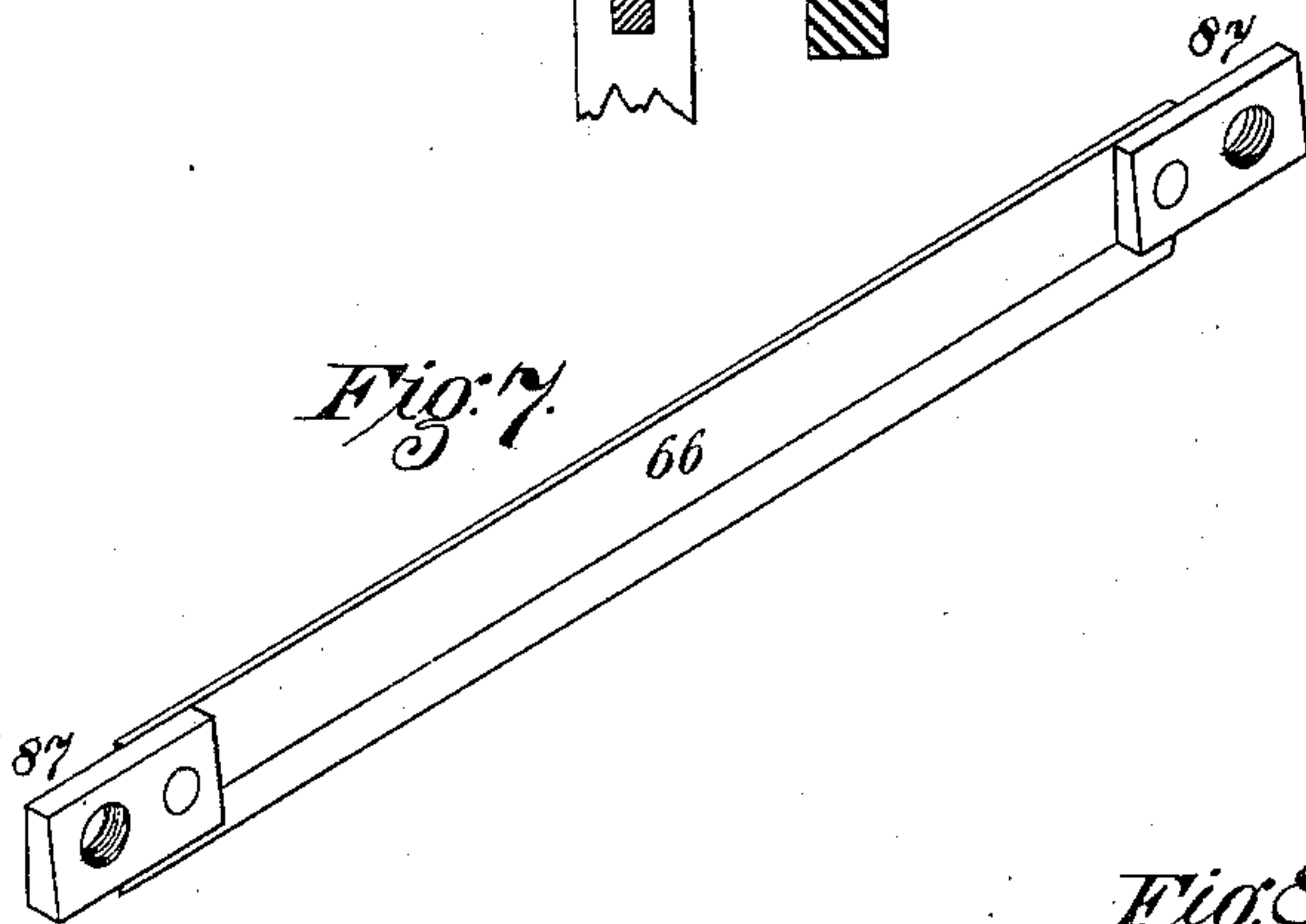
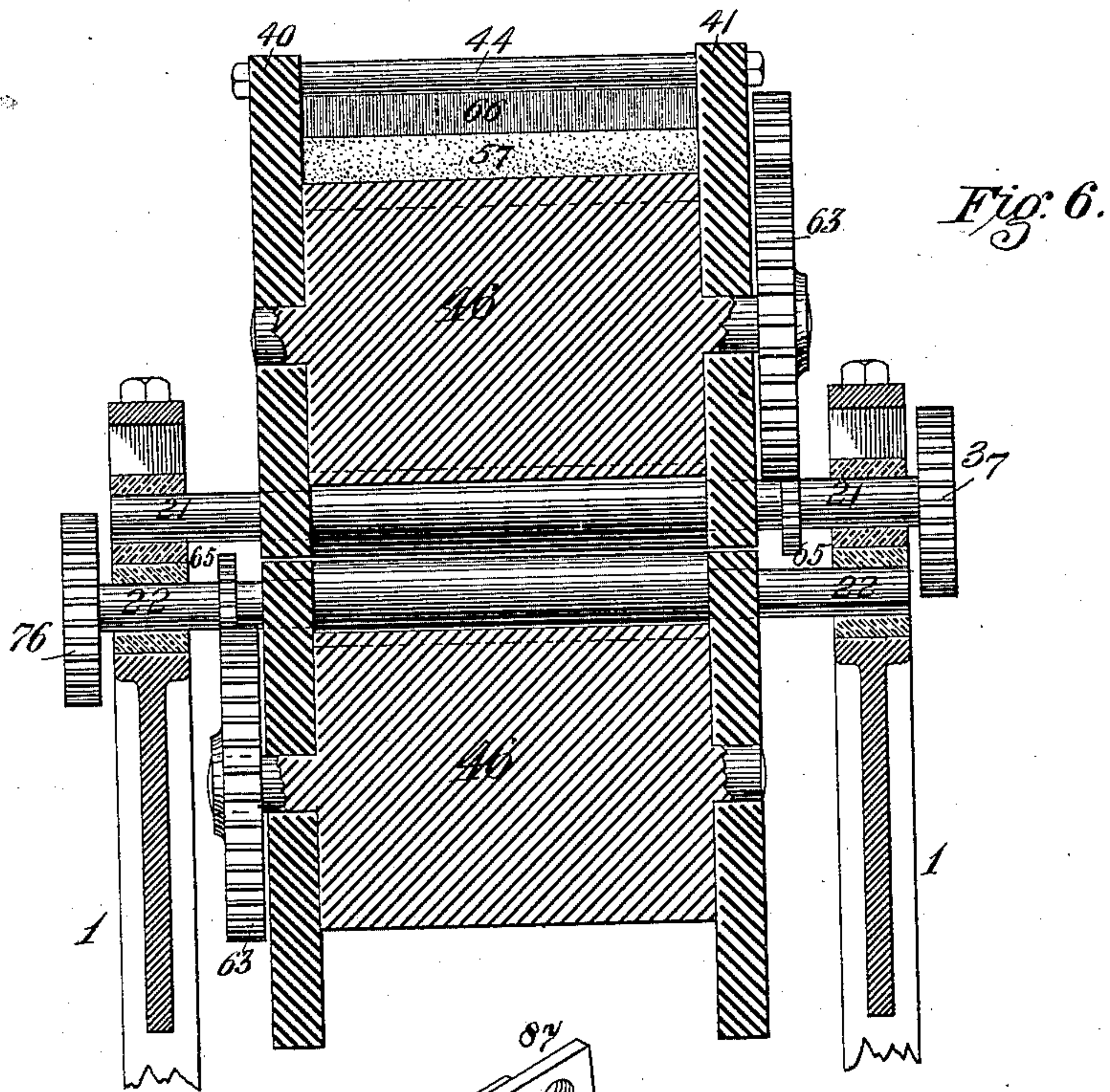
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UNITED STATES PATENT OFFICE.

GEORGE GIBSON, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO HIMSELF,
WILLIAM P. DILWORTH, WILLIAM M. LYON, AND JOHN M. TIERNAN,
ALL OF SAME PLACE, AND HENRY KLEBER, IDA KLEBER, HENRY
KLEBER, JR., AND LOUIS KLEBER, ALL OF ALLEGHENY, PENNSYLVANIA.

DECORTICATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 308,839, dated December 2, 1884.

Application filed July 12, 1884. (No model.)

To all whom it may concern:

Be it known that I, GEORGE GIBSON, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Decortivating-Machines, of which improvement the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a side elevation of one side of my improved decortivating-machine. Fig. 2 is a similar view of the opposite side of the machine, the apron-carriers being removed. Fig. 3 is a diagrammatic view showing the arrangement of the various rollers of the machine. Fig. 4 is a detail view on an enlarged scale of one of the roller-carriers. Fig. 5 is a sectional view of the same. Fig. 6 is a sectional elevation on the line *x x*, Fig. 2. Figs. 7 and 8 are detail views on an enlarged scale of one of the scrapers and the pick-up roll.

My invention relates to a new and improved machine for removing the fiber from jute, ramie, and other fibrous plants; and the object of my invention is to so treat the fibrous plants that the fibers may be obtained in a clean, unbroken, and parallel condition; and to this end my invention consists in the method and apparatus, as more fully hereinafter described and claimed.

On one side of the frame 1 is secured the shaft 2, on which is secured the power-wheel 3, and on the shaft 2 is also mounted the gear-wheel 4, preferably formed integral with the hub of the wheel 3. This gear-wheel meshes with the gear-wheel 5, secured to one end of the shaft of the lower crushing-roller, 6, and this wheel in turn meshes with the gear-wheel 7, secured to one end of the shaft of the upper crushing-roller. The shafts of these crushing-rollers 6 and 8 are mounted in journal-boxes 9, which are located in vertical slots 10 of the frame 1, the journal-box of the upper roller, 8, being free to move up and down in said slot, and the upper roller being held against the lower by the weighted levers 11, which are pivoted to the frame

of the machine and bear upon the journal-boxes 9 of the upper roller. The material to be crushed is fed to these rollers 6 and 8 by the endless apron 12, which passes around the rollers 13 and 14, the former being mounted in the frame 1 just in front of the crushing-rollers, and the roller 14 being mounted in the front end of the auxiliary frame 15, secured, as shown, to the front end of the frame 1. The roller 13 is driven by a belt, 16, passing around a pulley, 17, in the shaft of the lower crushing-roller, 6, (shown in dotted lines in Fig. 1,) and a pulley, 18, on one end of the roller 13, and that portion of the apron which moves toward the crushing-rollers is held in a horizontal position by a plate, 19, secured to the sides of the auxiliary frame under this portion of the apron. After being crushed between the rollers 6 and 8 the material passes along a horizontal guide-plate, 20, secured to the sides of the frame 1 just in the rear of the rollers 6 and 8, and is next caught by the feeding-rollers 21 and 22. These feeding-rollers are reduced at their ends to form journals, which are mounted in the journal-boxes 23 and 24 located in the vertical slots 25 in the frame 1, the upper roller, 21, being held in contact with the lower roller by the springs 26, the tension of which is regulated by the screws 27, passing through the cap-plate 28, secured to the frame over the slots 25. The lower feed-roller, 22, is driven by a gear-wheel, 30, secured to the power-shaft 2 through a train of idler-gears, 31 and 32, and a gear-wheel, 33, secured to the journal of the lower feed-roller. The upper feed-roller, 21, is driven from the same place and through the same train of idlers 31 and 32; but from this last idler motion is transmitted across the machine by the gear 34 and shaft 35, journaled on the sides of the frame 1. On the opposite end of this shaft 35 is secured the gear 36, which meshes with the gear 37 on the journal of the upper roller, 21.

On the rollers 21 and 22, inside of the frame 1, are mounted the carriers 38 and 39 of the fiber lifting and feeding rollers, and as these carriers are precisely similar in construction

I will confine my description to one of them, premising, however, that the upper carrier is pivotally supported on the upper roller, 21, and the lower carrier, 39, is pivotally hung from the lower roller, 22, and the relative positions of the various rolls of the upper carrier are reversed in the lower carrier, as will be plainly seen by reference to Fig. 3. The carrier consists of two side plates, 40 and 41, each having a nearly-circular head portion and a handle or lever, 42, held in proper relative position to each other by the brace-rods 43, 44, and 45, and the various rollers which are mounted in the carrier.

In describing the arrangement and mounting of the rollers in the carriers I will describe them in the order of their operation on the materials. In the center of the head portion of the plates 40 and 41 is mounted the main feeding-roll 46, which is slightly grooved on its surface, so as to take a hold on the fibers. Below the roll 46, and in close proximity to the rollers 21 and 22, is mounted what I term the "pick-up roller" 47, which catches the ends of the fibers and throws them up against the roll 46 as the crushing material is fed to said pick-up roll by the feed-rolls 21 and 22. The pick-up roll is spirally grooved on its surface, (see Fig. 8,) said grooves being so shaped as to form an edge, 48, on one side of the groove, but this edge 48 does not project beyond the periphery of the roll, and the edge will not, therefore, cut into the woody portion of the material passed between the pick-up rolls, but will present a smooth surface to said woody portion, the sole function of the edges being to catch the ends of the fibers as they are presented and throw said ends up against the roll 46. The pick-up roll 47 is provided with a journal, 49, at one end, which projects through the side plate and through a slot, 50, in the frame 1. On this projecting journal 49 is secured a small belt-pulley, 51, driven by a belt, 52, from any conveniently-located power-wheel. It will be understood that the journal of the pick-up 47 in the lower carrier projects on the opposite side of the machine, and is similarly driven by a belt, but in an opposite direction, as will be seen by reference to Figs. 1 and 2. The fibers are thrown against the roll 46 between the pick-up roll 47 and feed-roller 21, and the roll 46, revolving in the direction indicated by the arrows in Fig. 3, carries the fibers in between itself and the feed-roller 21. As the fibers pass from between the roll 46 and the roller 21 they are caught by a succession of rollers, 53, 54, 55, 56, and brush 57, and thus kept in contact with the roll 46 for a little more than half its circumference. These rollers 53 to 56 and brush 57 are mounted in journal-boxes located in radial slots 58, formed in the circumference of the head portion of the side plates, 40 and 41, and are held in contact with the main roll 46 by the springs 59, arranged in said radial slots between the journal-boxes and the cap-plate 60. One end of each of the rollers and brush are

provided with journals 61, which project beyond the side plate, 41, (see Fig. 4,) and on these projecting journals are secured the gears 62, which mesh into the gear 63, secured on the journal 64 of the roll 46. This gear 63 also meshes into and is driven by the gear 65, keyed to the journal of the feed-roller 21.

To prevent the fibers from getting wrapped around any of the rollers 53 to 56, scrapers 66 are arranged in contact with said rollers, as shown in Fig. 5. These scrapers, consisting of steel blades having a sharpened edge, are held in place by studs 67, screwed through the plates 40 and 41, and provided at their inner ends with slots, into which the ends of the scrapers tightly fit. The scraper of the roller 56 is attached to the brace-rod 44, differing in this manner of attachment from the other scrapers.

To prevent the fiber from being caught by the brush 57, a blade provided with a comb-edge is substituted for the scrapers. In operating in some fibrous material a brush is not essential for cleaning the same, in which case a plain roller and a scraper are substituted for the brush and comb. As the fibers pass from under the last roller 56, they are lifted from the roll 46 by a scraper, 68, and, sliding over said scraper, they pass upon an endless apron, 69, which passes around the rolls 70 and 71, the former being mounted in the side plates, 40 and 41, and the latter in the rear end of the auxiliary frame 72, attached to the rear end of the frame 1. There are two of these aprons 69 to carry away the fibers from each of the carriers. The scraper 68 is provided at its ends with the lugs 87, which project into the radial grooves 88 in the plates 40 and 41, and through these lugs pass screws 89, their lower ends bearing upon the end of the grooves 88. Around these screws 89 are placed the spiral springs 90. The lower ends of the springs rest upon the lugs 87 and the upper ends bearing against the cap-plates 91, secured over the grooves 88. By turning the screws 89 the scrapers can be adjusted to and from the roll 46. The woody part from which the fibers have been removed as above described passes on between the pick-up rolls 47, and is caught by the fluted rollers 73, which are mounted in journal-boxes 74, located in the vertical slots 75 in the frame 1, the lower roller having the gear 76 secured on one of its journals, said gear meshing with the idler 77, which meshes with and is driven by the gear 33 of the lower feed-roll, 22, (see Fig. 1,) and the upper fluted roll is driven by the gear 37, secured on the journal of the upper roller, 21, through the idler 78, and the gear 79, secured to the projecting journal of the upper fluted roller, (see Fig. 2,) which is held against the lower by springs in the slots 75. From these fluted rollers 73 the woody part passes along the inclined table 80, in which are mounted at certain intervals the rollers 81, said rollers being driven by the belt 82 from the roller 71, over which the lower apron, 69,

passes. The journals of the rollers 71 are mounted in horizontal slots 83 in the sides of the auxiliary frame 72, and are adjusted in said slots by the slotted plates 84. The rollers 71 are driven by the belt 85 from the pulley 86, secured to the journal of the lower crushing-roller, 6, said belt passing around the rollers 71, as shown in Fig. 1.

The carriers 38 and 39 are pivotally mounted on journals of the feed-rollers 21 and 22, as above stated, and the adjustment of said carriers to bring the pick-up rollers 47 in proper proximity to each other and into proper relation to the feed-rollers 21 and 22 is effected by turning said carriers on their pivotal rollers 21 and 22. This turning or partial rotation of the carriers is effected by the handles or levers 42, forming part of the side plates, 40 and 41. The handles or levers of the upper carrier rest upon the pins 92, located in the vertical slots 93 in the frame 1, that part of the pins which passes through the slots being reduced in size, thereby forming a shoulder, and the pins are held in any desired position by drawing said shoulder against the edges of the slot by means of a nut screwing on the reduced portion of the pins. The handles of the lower carrier, 39, rest upon pins 94, located in slots 95, these pins being similar in construction to the pins 92, above described.

To relieve lower roller, 22, of part of the weight of the lower carrier, 39, said carrier is supported by the weighted lever 95, pivoted on pins secured in the sides of the frame 1, the free ends of said levers bearing against the side plates of the lower carrier.

Immediately over the journals of the upper fluted roller, 73, plates 96 are adjustably secured to the side plates, 40 and 41. These plates 96 bear lightly on the journals of the fluted roller when the levers 42 rest upon the supporting-pins 92. The purpose of these plates 96 will be more fully stated hereinafter.

To obtain the fiber from jute, ramie, and other fibrous plants they are treated in the following manner: The fibrous material is placed upon the apron 12, and is delivered by it to the crushing-rolls 6 and 8, which are so adjusted by the weighted levers 11 as to crush the materials to a uniform thickness and loosen the fiber from the woody stalk. From the crushing-rolls the crushed material passes along the guide-plates 20, and is then caught by the feed-rollers 21 and 22, whose adjacent surfaces revolve in the direction of the feed of the crushed material. These feed-rollers present the material to the pick-up rolls 47, revolving in a direction contrary to the feed, as indicated by arrows in Fig. 3. These pick-up rolls are so adjusted with reference to each other by turning their carriers as above described that the edges 48 will catch the ends of the fibrous part of the crushed material, one of said rolls acting on the upper and the other on the lower surface of the crushed material, and, lifting this fibrous part from the woody stalk, will throw it against the main

rolls 46, which revolve in a direction contrary to the previous feed of the material. As the fibers are thrown by the centrifugal force of the pick-up rolls 47 against the surfaces of these rolls 46, which are slightly grooved, they are carried by said rolls over the feed-rolls 21 and 22, and from thence the fibers are carried on around the rolls 46, passing in succession under the rollers 53, 54, 55, 56, and 57, and after passing from under the rollers 57 these fibers are lifted from the roll 46 by the scraper 68, and from thence are delivered upon the aprons 69.

Having followed the fibrous part of the material through the machine, I will now return and describe the passage of the woody stalk from the feed-rolls 21 and 22. From these rolls 21 and 22 the stalk freed from its fibers passes between the pick-up rolls 47, which do not act upon the stalk, as above stated, but the centrifugal force of said rolls acts, as it were, to keep the stalk from contact with the rolls, and thus, although revolving against the feed of the stalk, they do not offer any material opposition to said feed. After passing between the pick-up rolls the stalk is caught by the fluted feed-rolls 73, and by them fed onto the table 80. These fluted rolls 73 are so adjusted that the upper roll will be slightly raised by the entrance of the stalk, and in rising this upper roll will slightly turn the upper carrier on its pivotal point through the medium of the plates 96, which in the normal position of the parts rests but slightly on the journal of the upper fluted rolls. By this movement of the upper carrier the pick-up rolls 47 are slightly separated, to diminish the bite of said rolls on the material, and to permit of a more unimpeded passage of the stalk. It will be noticed, however, that this separation of the pick-up rolls does not occur until after they have performed their function of lifting the fibers from the woody stalk and delivered them to fiber-feed rolls mounted in the carrier. After the fibers have been caught by their feed-rolls they will be stripped from the woody stalk without the interposition of the pick-up rolls. The separation of the pick-up rolls should not be so great as to prevent them from catching the ends of the fibers which might be broken and delivering such broken ends to the feed-rolls.

It will be observed that it is a characteristic of my machine that the fibers are stripped from the stalks in long lengths and are kept straight and even, which is impossible when the fibers are scraped off, as has heretofore been customary.

In treating ramie and other similar plants a brush is substituted for one of the small rolls in the carriers for the purpose of cleaning the fibers; but in treating jute this brush is not essential.

I claim herein as my invention—

1. In a decorticating-machine, a pair of crushing or fiber-loosening rolls, in combination with a pair of fiber-lifting rolls, and rolls

for feeding the freed fibers, substantially as set forth.

2. In a decorticating-machine, a pair of crushing or fiber-loosening rolls, in combination with a pair of adjustable fiber-lifting rolls, and rolls for feeding the freed fibers, substantially as set forth.

3. In a decorticating-machine, a pair of crushing-rolls, in combination with a pair of fiber-lifting rolls, and pivotal carriers for supporting the fiber-lifting rolls, substantially as set forth.

4. In a decorticating-machine, a pair of crushing-rolls, in combination with a pair of feed-rolls, carriers pivotally supported on the feed-rolls, and a pair of fiber-lifting rolls mounted in said carriers, substantially as set forth.

5. In a decorticating-machine, a pair of feed-rolls, in combination with carriers pivotally supported on the feed-rolls, a pair of fiber-lifting rolls, and a series of fiber-feeding rolls, the lifting and feeding rolls being mounted in the carriers, substantially as set forth.

6. In a decorticating-machine, a pair of feeding-rolls, in combination with carriers pivotally supported on the feed-rolls, each carrier having mounted therein a fiber-lifting roll and a series of feeding-rolls, and a pair of stalk-feeding rolls located in the rear of the carriers, substantially as set forth.

7. In a decorticating-machine, a pair of feed-rolls, in combination with carriers pivotally supported on the feed-rolls, and provided with levers or handles for adjusting the po-

sition of said carriers, and having each carrier mounted therein, a fiber-lifting roll, a series of feed-rolls, and a roll supporting one end of a feed-apron, substantially as set forth.

8. In a decorticating-machine, a pair of feed-rolls, in combination with carriers pivotally supported on the feed-rolls, and each having mounted therein a fiber-lifting roll, a pair of stalk-feeding rolls, and an adjustable plate secured to the upper carrier and resting upon the upper stalk-feed roll, substantially as set forth.

9. In a decorticating-machine, a pair of carriers adjustably mounted one above the other, each of said carriers having mounted therein a fiber-lifting roll, a central feed-roll, and a series of feed-rolls arranged around the central roll, substantially as set forth.

10. As an improvement in the art of separating vegetable fibers from the woody body of jute, ramie, and other like plants, the herein-described method, which consists in loosening the fibrous covering or bark from the woody body by breaking or crushing the stalks of such plants longitudinally, and then lifting or pulling the fibrous covering or bark from the woody body in continuous transversely unbroken lengths, substantially as set forth.

In testimony whereof I have hereunto set my hand.

GEORGE GIBSON.

Witnesses:

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R. H. WHITTLESEY.